CHAPTER 9

Firearms and Ammunition

Solving a crime that involves firearms often depends on the scientific examination of evidence by a qualified examiner at the criminal investigation laboratory. Laboratory examination may show that a projectile or an expended cartridge case was fired from or in a specific weapon. Testing the mechanical condition of a weapon may show that an accidental discharge was possible. Other tests may show the presence or absence of gunpowder residues in the barrel of a weapon. A fired bullet or cartridge case may show the caliber and type of weapon that fired it. It may also tell the manufacturer of the ammunition. Tests may show the distance between the muzzle of the weapon and the point of contact. They may also show the point of entrance and/or exit of a projectile in clothing, wood, glass or metal.

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Investigators do not perform firearms identification tests in the field. The USACIL firearms examiners do the identification tests at the lab, and give test results to the investigator in the field. They also give expert testimony in court when needed. But while expert testimony may be given only by such a qualified lab examiner, the solving of a crime involving firearms may depend on how you, the investigator, collect and preserve firearm evidence.

RECOVERING AND PRESERVING EVIDENCE

Any item that may need the services of a firearms examiner must be handled with care to make sure it is not altered or damaged. For instance, you must try to have medical personnel cut around bullet holes to leave them intact when removing clothing from shooting victims. And you must also make sure the items do not become contaminated. Be especially careful when clothing and like items are involved. Air dry bloodstained and semen-stained clothes before packaging.

You may find it hard to recover fired bullets at a crime scene. Never probe for, or try to extract, a bullet with other than rubber or heavily taped tools. It is often best to take a small section of the wall, ceiling, or the like with the bullet still in it. By forwarding it intact to the laboratory you prevent damage to the bullet.

You may have a case where you feel that a weapon should be processed for latent prints. The parts of weapons having a slight oily film are not ideal for the development of latent impressions. However, it is possible to get usable impressions. Firearms evidence to be sent to the lab to learn when the weapon was last fired or for powder residue should not be processed for prints before the lab examines it. Latent print techniques may hinder the examinations of the firearms examiner. At the lab, the fingerprint and firearms examiners will coordinate their efforts.

MARKING EVIDENCE

Evidence must be marked so it may be readily identified later. Firearms known to be of evidence value are marked immediately. But those seized or impounded to decide their value are not to be marked, scratched, or defaced in any way. These items are marked only after it is decided that the firearm has value as evidence. Use common sense in marking antique weapons and highly engraved weapons: Protect their value.

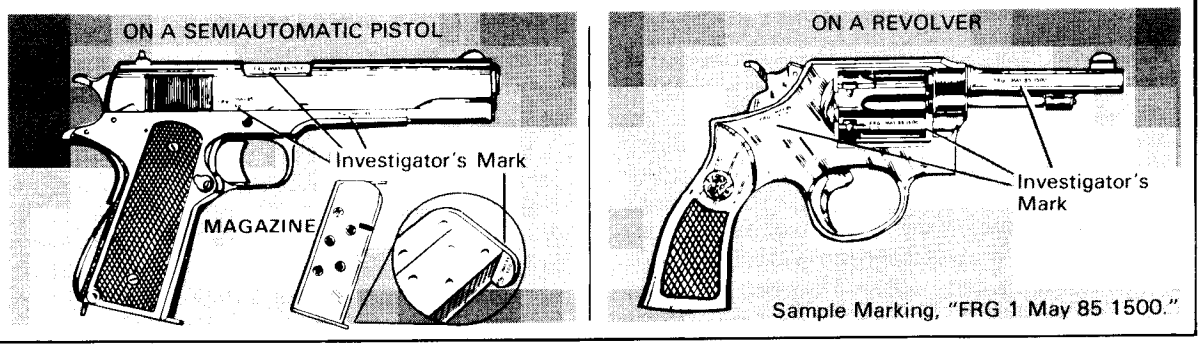
Place your initials and the time and date of recovery on each item of evidence so you can positively identify it at a later date. When several like items are found, add an identifying number on each item. No two items of evidence in the same case should bear the same identifying numbers. All identifying marks and a description of items to which they are affixed should be put in your notes. The identifying number has no bearing on the numbers of the exhibits in the report of investigation.

Marking tools may be used for inscribing identifying markings on firearms evidence. Diamond point or Carborundum pencils are ideal. Dental picks make excellent marking devices when the curved tip is cut off and the point made needle-sharp. These can be obtained at dental clinics and dentist's offices from time to time.

Firearms are most often marked on the right side of the frame. Mark all parts of the firearm that can be removed and that leave imprints on either the bullet or cartridge case. For example, you would mark a conventional .45 caliber semiautomatic pistol in three places. You would mark the barrel, which marks the bullet; the slide, which contains the extractor and firing pin; and the receiver, which includes the ejector which marks the cartridge case. All parts of a weapon should be marked alike. Put your mark where the marking can be seen but will not interfere with existing markings or stampings on the weapon. Mark the magazine on the base toe and submit it with the suspect weapon.

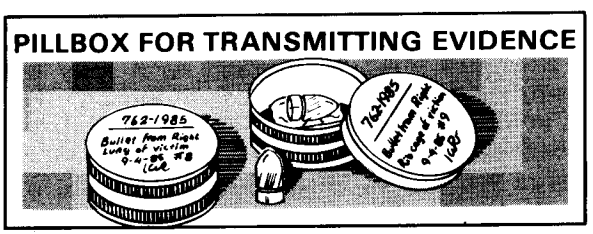
Because some revolvers have interchangeable cylinders, revolvers are marked on both cylinder and barrel. Some revolvers have a removable side plate. Mark them on the side of the frame that cannot be removed. Mark weapons having removable bolts—semiautomatic and automatic weapons, as well as bolt-action weapons—on the bolt, barrel, and frame. If the barrel of a weapon cannot be removed without tools, you do not need to mark it. But marking the barrel, even under these circumstances, adds certainty.

INVESTIGATOR'S MARKINGS ON FIREARMS EVIDENCE



A fired bullet submitted as an exhibit may be jacketed or lead. Do not place any markings on the bullet. Identification marks may cause the loss of trace evidence or evidence marks. Rinse the bullet if it is not to undergo serology testing or examination for other trace evidence. Ridding the bullet of body fluids or other contaminants will help the firearms examiner. Rinse with care, making sure you do not rub the item. Place bullets in suitable containers. Pillboxes, plastic vials, and the like that have cotton packing material are fine. Seal the container with paper packaging tape or the equivalent; do not use cellophane or masking tape. Mark the container so markings are on both tape and package. Record the time and date of sealing, your initials or signature, and the USACIDC sequence number or MP report number. Deformed bullets and jacket fragments must also be placed in a container and marked as described above.

PILLBOX FOR TRANSMITTING EVIDENCE



Do not mark cartridge cases. Treat them the same way you treat bullets, then place them in a container. Do not mark shotgun shell cases, wads, or shot columns either. Shot pellets (birdshot, buckshot, other) known to be from one source can be placed together in a container. Seal container and mark it for identification.

TRANSMITTING EVIDENCE

Unload firearms to be examined at the USACIL before preparing them for shipment. If a firearm cannot be unloaded, contact the USACIL for advice and shipping instructions. Firearms may be shipped by US mail as allowed by postal laws and regulations. Live ammunition, propellant powders, primers, or explosives may not be sent through US civil or military mails. Such items are shipped by freight or transported by courier.

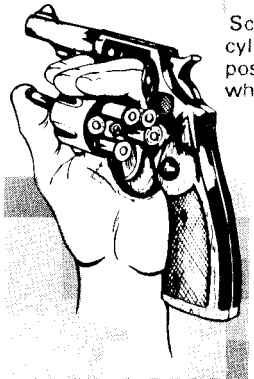
Wrap firearms in a clean protective covering. This prevents dust, lint, and other foreign matter from filtering into the mechanism. Pack in suitable shipping containers. When the evidence is to be examined for fingerprints, use special packaging procedures. If you have a question about how to pack or ship evidence, contact the USACIL.

Do not clean firearms before shipping them to the lab. But if there is a lot of moisture in the weapon barrel, remove as much of it as you can to stop rust from forming. Use a single dry patch. Record this fact in your notes and on the lab request. A collection of rust makes it hard for the lab examiner to conduct a comparison test. In a special case, when firearms must be cleaned, consult the USACIL. And be sure to send the cleaning patch to the lab when you send the weapon.

All ammunition found in the possession of a suspect or at the scene of a crime is seized and held as evidence. The laboratory may have enough ammunition of a like type to use for test needs. Contact the lab firearms division to learn if they have the right ammunition. If not, arrange for ammunition picked as evidence to be sent to the lab with the weapon.

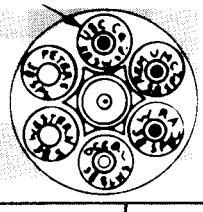
When revolvers having loaded cartridges or fired cases are obtained, make a diagram of the rear face of each cylinder. Show the position of the loaded cartridges or the fired cases with respect to one another and to the firing pin. Scratch an arrow on each side or rear face of the cylinder lying under the firing pin when the revolver was found. Do this on the revolver, itself, and also on the diagram. Your diagram, complete with legend, lets the lab examiner relate the fired cartridges to the chamber of the cylinder in which they were fired.

NOTATION OF THE POSITION OF THE CARTRIDGES IN A RECOVERED REVOLVER

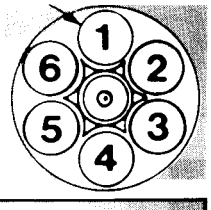


FACING REAR OF CYLINDER

Scratch arrow on rear face of cylinder to show the chamber positioned under the hammer when weapon was recovered.



Draw diagram; label chamber under the hammer "1"; number remaining chambers clockwise.



Investigator's Mark	Chamber Position	Condition	Maker
CW/1	#1	Fired	U.S. Cartridge Co.
CW/2	#2	Fired	Remington Arms Co.
CW/3	#3	Fired	Winchester Repeating Arms Co.
CW/4	#4	Misfire	Dominion Cartridge Co.
CW/5	#5	Loaded	Western Cartridge Co.
CW/6	#6	Loaded	Peters Cartridge Co.

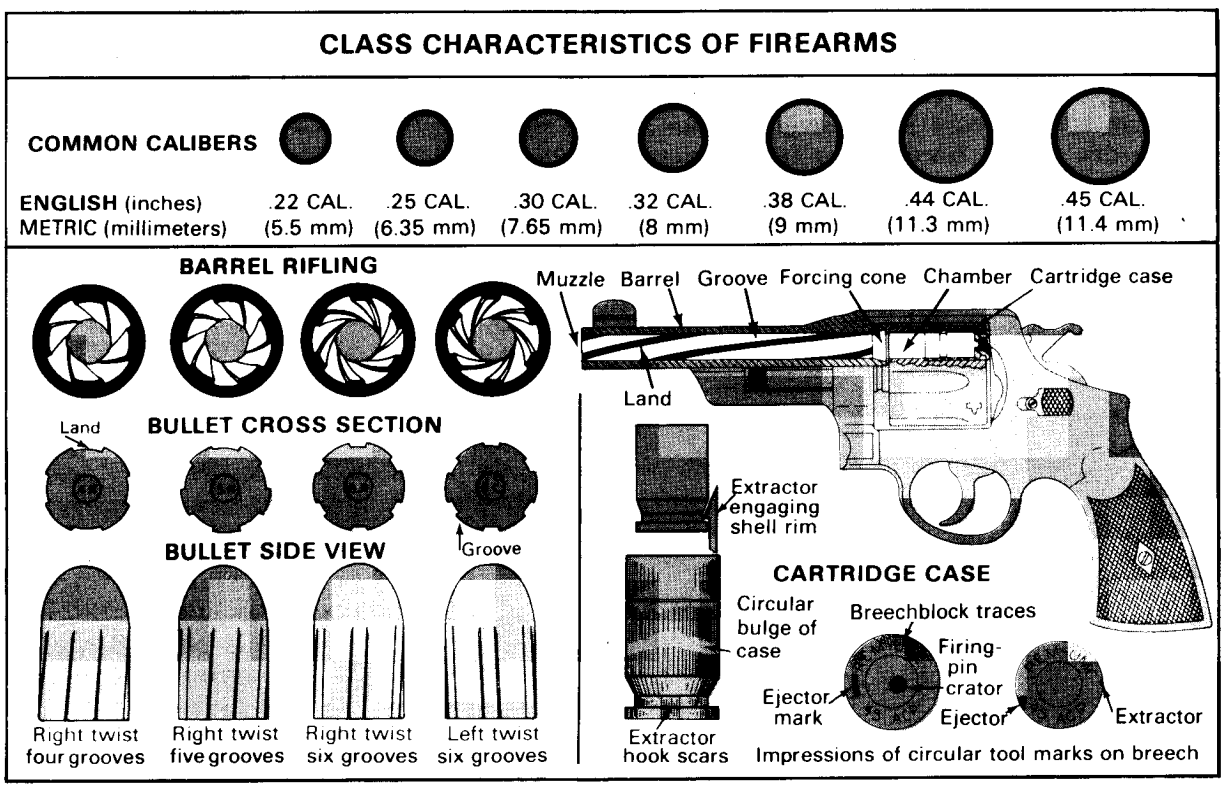
Pack clothing items being sent to the firearms division for proximity tests so the area around the entrance hole in the garment does not become contaminated. Do this by sandwiching between sheets of cardboard or brown paper the part of the garment containing the gunshot residues.

TESTING AT THE LAB

Testing by lab examiners can provide you with information you are not able to determine by field examination. For instance, in gunshot wounds, powder residues may be deposited either on skin or clothing. Only pathologists or other qualified medical persons may give an expert opinion on gunshot wounds in flesh and on their powder pattern. And only lab examiners can give you an expert opinion on powder residue in clothing. By firing a suspect weapon, using ammunition of the type that left the residue, they can make tests to learn the approximate distance from muzzle to point of contact. These proximity tests are based on the dispersion of the gunpowder residues. They are, of course, subject to limitations. A scaled photo of the wound may be helpful to a firearms examiner examining the clothing worn by the victim. Normally, with a muzzle to target distance in excess of 2 ½ feet, no discernible gunpowder residue pattern will be present. But particles may be present even at a distance beyond 8 feet.

Sometimes a firearm has had a serial number or other die-stamped lettering removed. Showing ownership or otherwise identifying the item may depend on discerning the serial number. *This is a job for the lab.* Do not try to do it on your own.

Often the lab can examine a fired bullet or even a cartridge case alone to learn facts of the class characteristics of the firearm involved. The lab can tell you the caliber and type of firearm (pistol, revolver, rifle) from which the bullet was fired. The number and width of lands and grooves in the rifling and the direction of twist may also be provided.



TEST FIRING

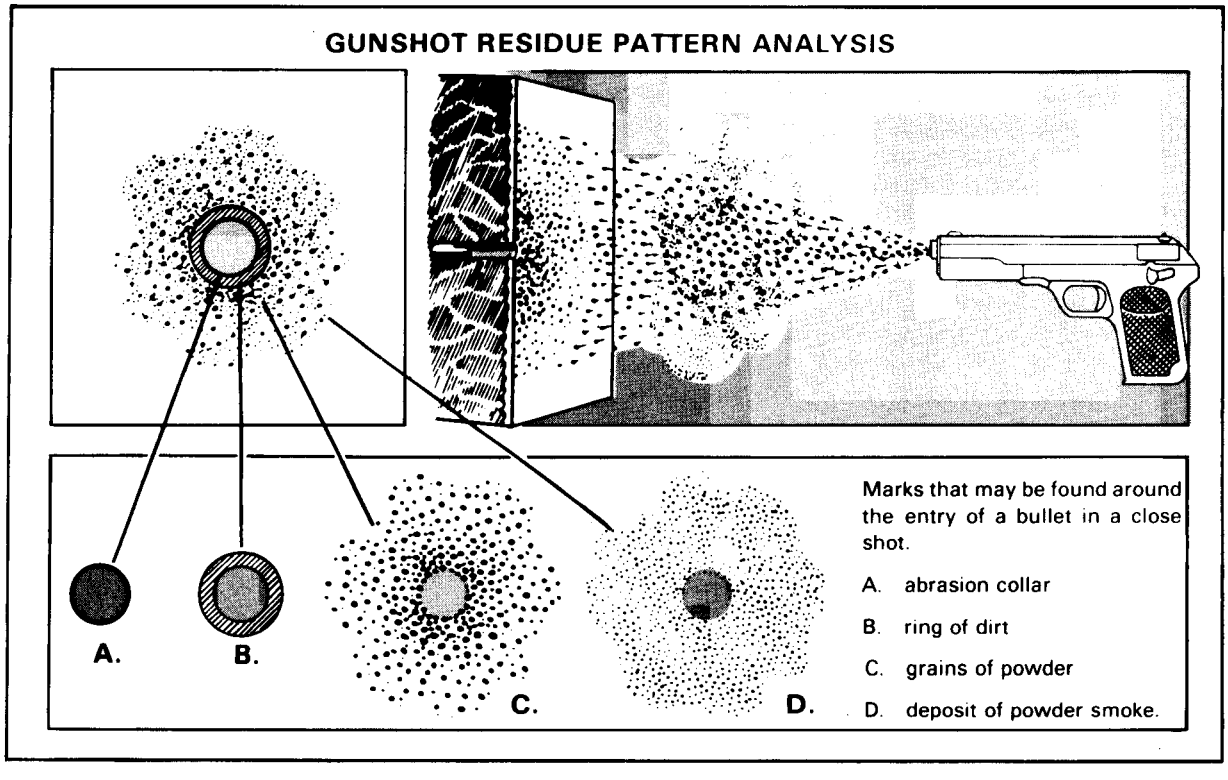
If a firearm is sent to the lab with fired bullets, cartridge cases, or both, tests can be done to see if the ammunition was fired from that weapon. If the class characteristics of the spent ammunition is consistent with that fired from a weapon like the exhibit weapon, test firing will be done. Then the test bullets and cartridge cases will be microscopically compared with the exhibit items. If many firearms are suspect weapons in a case, it may not be wise to ship all the weapons. In such cases, contact the supporting lab for advice.

All firearms uncovered during the investigation of homicides, suicides, assaults, and robberies should be submitted for function testing. Often the value of learning if a firearm will function and if it functions safely is overlooked. It may be that a firearm could not have discharged accidentally as stated by a suspect. Or a particular firearm may not be capable of firing at all.

GUNSHOT RESIDUE ANALYSIS

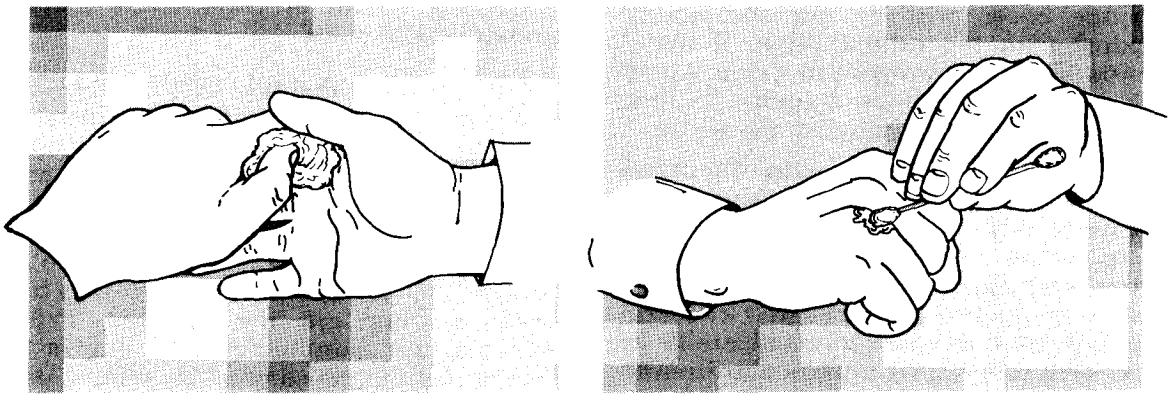
There are two types of gunshot residue tests done at the lab. One, discussed earlier in this chapter, is done to 'search for and identify unburnt powder particles and measure muzzle-to-target distances using the residue patterns left on the target. The other is done to detect primer residue to tell if a subject has handled or fired a weapon. This is from the test commonly known as the "gunshot residue test." Examiners at Trace Branch, USACIL-Continental United States (CONUS), do all of USACIDC's gunshot primer residue tests.

The primer residue test checks for antimony and barium, two metallic elements often found in primer mixtures. The primer mixture, detonated by the firing pin, is what ignites the gunpowder in the cartridge. The nature of this residue is such that, at present, only swabbings are tested. Gloves or other articles of clothing that the subject may have been wearing are not checked. Primer mixtures are manufactured by only a few companies. They cannot be related to a specific brand or type of ammunition. The lab cannot tell from the residue test what brand of ammunition was used. Likewise, the test does not show which weapon was used by a subject or which was used to fire certain ammunition.



The primer residue collection kits issued by USACIDC have all of the items needed to swab the subject's hands. They give the proper analytical controls as well. The process picks up the residue for protection in a vial. In this way the samples can be sent safely to the lab. Presently, there are two brands of kits. They differ only slightly, and either is suitable. Each kit has a set of instructions.

PRIMER RESIDUE COLLECTION



A check for primer residue can be made by swabbing a suspect's hands and sending the collected material to the lab for analysis.